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CONTEXTUAL AUDIO SYSTEM**FIELD**

The described embodiments relate generally to adjusting audio output of a wearable audio device based on a context of a user, such as a location. More particularly, the present embodiments relate to a wearable audio device in communication with a sensing device; the devices may use positional data and other data to adjust audio output from the wearable audio device to enhance a user's safety or direct a user's attention.

BACKGROUND

Recent advances in portable computing have provided users with an unprecedented amount of content to consume in nearly any setting. Wearable electronic devices, such as earbuds, headphones, glasses, and the like provide audio to a user substantially wherever or whenever he or she may be. While this facilitates user choice, it has the unintended side effect of often consuming a user's attention, or otherwise distracting him or her, in some situations. This may impact a user's safety as well as the safety of those around her.

SUMMARY

Some embodiments described herein take the form of a contextual audio system, comprising: a wearable audio device, comprising: an audio output structure; and a receiver; and a sensing device, comprising: a transmitter in communication with the receiver; and a position sensor configured to receive positional data; wherein: at least one of the wearable audio device or the sensing device is configured to adjust audio output from the audio output structure in response to the positional data.

Still other embodiments take the form of a method for operating a contextual audio system, comprising: receiving positional data for a sensing device of the contextual audio system; determining the sensing device's location from the positional data; determining that the location is one where a user should be alert; and in response to determining that the location is one where the user should be alert, adjusting an audio output of a wearable audio device of the contextual audio system.

Yet other embodiments take the form of a contextual audio system, comprising: a pair of earbuds; and a smart watch in wireless communication with the pair of earbuds; wherein: the pair of earbuds is configured to provide audio output to a user; the smart watch is configured to determine a location of the user; the smart watch is further configured to execute an application; the smart watch is configured to determine whether the pair of earbuds is to adjust its audio based on the location of the user and the application; the smart watch is configured to provide an instruction to the pair of earbuds to adjust its audio output; and the pair of earbuds is configured to adjust the audio output in response to the instruction from the smart watch.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

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FIG. 1 depicts a sample contextual audio system;

FIG. 2 depicts a sample block diagram of a wearable audio device;

FIG. 3 depicts a sample block diagram of a sensing device;

FIG. 4A depicts a sample contextual audio system in use by a user cycling along a road and in a first position;

FIG. 4B depicts the sample contextual audio system of FIG. 4A and its user in a second position, while cycling along the road;

FIG. 5A depicts a user of a contextual audio system leaning to one side;

FIG. 5B depicts the user of FIG. 5A standing straight;

FIG. 6 depicts another embodiment of a sensing device;

FIG. 7A depicts a user of a contextual audio system off-balance while standing on the sensing device of FIG. 6;

FIG. 7B depicts the user of FIG. 7A standing straight and balanced on the sensing device of FIG. 6; and

FIG. 8 depicts a sample method of operation for a sample contextual audio system.

DETAILED DESCRIPTION

Embodiments described herein generally take the form of a contextual audio system configured to adjust audio playback in response to positional data. The contextual audio system may include a wearable audio device and, optionally, a sensing device. In some embodiments, the sensing device and the wearable audio device are the same. Generally, the contextual audio system employs different types of data to determine a user's location and/or activity (both of which are examples of "context") and adjust audio output of the wearable audio device portion of the system.

"Positional data," as used herein, generally refer to data about a user's (or device's) location, motion, speed, acceleration, weight distribution, balance, or other spatial location and/or orientation. GPS positioning, travel speed, facing, proximity to objects or places, posture, language selected on an electronic device (insofar as that language may provide suggestion or indication as to a user's native country), location relative to an object, and so on are all non-comprehensive examples of positional data.

As one example embodiment, the contextual audio system may employ positional data sensed by a wearable electronic device or other electronic sensing device, optionally coupled with secondary data sensed or received by the wearable electronic device or sensing device, to control audio output to a user. The audio may be outputted by the wearable electronic device to the user's ears. Examples of controlling audio output include: adjusting audio volume; stopping or preventing audio from playing; providing feedback, directions, encouragement, advice, safety information, instructions, and the like; and so on. In some embodiments, the positional data may be GPS data received by either the wearable audio device or a sensing device, and in some embodiments the wearable audio device may be "stand alone" insofar as the sensing device may be omitted (or incorporated into the wearable audio device).

As another example embodiment of a contextual audio system, headphones, earphones, earbuds, or the like (collectively referred to as a "wearable audio device") may be in wired or wireless electronic communication with a second electronic device, such as a smart telephone, watch or other wearable electronic device (e.g., glasses, clothing, jewelry, or the like), tablet computing device, portable media player, computer, and so on. The second electronic device may incorporate, include, or embody one or more sensors configured to sense positional data. The second electronic